



EMI TEST REPORT

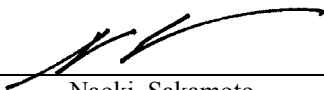
Test Report No. : 25AE0222-HO-1

Applicant : **DENSO WAVE INCORPORATED**
Type of Equipment : **Bluetooth Board**
Model No. : **DWBT003**
Test standard : **FCC Part 15 Subpart C**
Section 15.207, Section 15.247: 2004
FCC ID : **PZWDWBT003**
Test Result : **Complied**

1. This test report shall not be reproduced in full or partial, without the written approval of UL Apex Co., Ltd.
2. The results in this report apply only to the sample tested.
3. This equipment is in compliance with above regulation. We hereby certify that the data contain a true representation of the EMC profile.
4. The test results in this report are traceable to the national or international standards.

Date of test: September 14 and 16 , 2004

Tested by:



Naoki Sakamoto
EMC Service

Approved by :



Hironobu Shimoji
Group Leader of
EMC Service

CONTENTS	PAGE
SECTION 1: Client information	3
SECTION 2: Equipment under test (E.U.T.).....	3
SECTION 3: Test specification, procedures & results	5
SECTION 4: Operation of E.U.T. during testing.....	8
SECTION 5: Conducted Emission.....	9
SECTION 6: Spurious Emission	10
SECTION 7: Bandwidth.....	11
SECTION 8: Maximum Peak Output Power	11
SECTION 9: Carrier Frequency Separation.....	11
SECTION 10: Number of Hopping Frequency	11
SECTION 11: Dwell time	11
APPENDIX 1: Photographs of test setup	12
Conducted Emission.....	12
Spurious Emission (Radiated).....	13
Worst Case Position (Z-axis:Horizontal / Y-axis:Vertical)	14
APPENDIX 2:Test instruments	15
APPENDIX 3: Data of EMI test.....	16
Conducted Emission.....	16
Carrier Frequency Separation(FHSS).....	18
20dB Bandwidth(FHSS)	20
Number of Hopping Frequency(FHSS).....	22
Maximum Peak Output Power(FHSS).....	27
Radiated Spurious Emission(FHSS).....	29
Conducted Spurious Emission (FHSS).....	35
99% Occupied Bandwidth(FHSS)	39

SECTION 1: Client information

Company Name : DENSO WAVE INCORPORATED
Brand name : DENSO
Address : 1-1, Showa-cho, Kariya-shi, Aichi-ken, 448-8661 Japan
Telephone Number : +81-566-61-7974
Facsimile Number : +81-566-25-4741
Contact Person : Osamu Fujiwara

SECTION 2: Equipment under test (E.U.T.)

2.1 Identification of E.U.T.

Type of Equipment : Bluetooth Board
Model No. : DWBT003
Serial No. : No.4(for the AC main conducted test)
00037A0BE8FC(for the Radiated emission and Antenna terminal
conducted test)
Rating : DC3.3V
Country of Manufacture : Japan
Receipt Date of Sample : September 13, 2004
Condition of EUT : Production prototype
(Not for Sale: This sample is equivalent to mass-produced items.)

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

2.2 Product Description

Model No: DWBT003(referred to as the EUT in this report) is the Bluetooth Board.

Equipment Type		Transceiver
Frequency band	Lower limit	2402MHz
	Upper limit	2480MHz
Frequency of Operation		2402-2480MHz
Bandwidth & Channel spacing		1MHz & 1MHz
Type of Modulation		GFSK(FHSS)
Antenna Type		Inverted-F type multi-layer antenna
Antenna Connector Type		N/A
Antenna Gain		2.044dBi
Temperature of Operation		-5 deg.C. to +50 deg.C.
ITU code		F1D
Power Supply		DC3.3V

FCC 15.31 (e)

This EUT provides stable voltage(DC3.3V) constantly to RF Module regardless of input voltage. Therefore, this EUT complies with the requirement.

FCC Part 15.203 Antenna requirement

Since the antenna used is a type of chip component and is permanently mounted by soldering on a printed circuit board in DWBT003, It is impossible for end users to replace it without assistance of professionals. Therefore, this EUT complies with the requirement.

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

SECTION 3: Test specification, procedures & results

3.1 Test Specification

Test Specification : FCC Part15 Subpart C : 2004

Title : FCC 47CFR Part15 Radio Frequency Device Subpart C Intentional Radiators
Section 15.207 Conducted limits : 2004
Section 15.247 Operation within the bands 902-928MHz,
2400-2483.5MHz, and 5725-5850MHz : 2004

3.2 Procedures and results

[FHSS]

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	Conducted emission	ANSI C63.4:2003 7. AC powerline conducted emission measurements	Section 15.207	-	N/A	18.9dB 0.1572MHz, N, AV	Complied
2	Carrier Frequency Separation	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(a)(1)	Conducted	N/A	*See data.	Complied
3	20dB Bandwidth	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(a)(1)	Conducted	N/A		Complied
4	Number of Hopping Frequency	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(a)(1)(iii)	Conducted	N/A		Complied
5	Dwell time	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(a)(1)(iii)	Conducted	N/A		Complied
6	Maximum Peak Output Power	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(b)(1)	Conducted	N/A		Complied
7	Band Edge Compliance	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(d)	Conducted	N/A		Complied
8	Spurious Emission	ANSI C63.4:2003 13. Measurement of intentional radiators	Section 15.247(d)	Conducted/ Radiated	N/A	2.8dB 383.405MHz Horizontal (Tx2480MHz)	Complied

Note: UL Apex's EMI Work Procedures No.QPM05.

Uncertainty:

*In case of the margin below the EMC Head Office's uncertainty

The data listed in this report meets the limits unless the uncertainty is taken into consideration.

Conducted Emission

The measurement uncertainty (with a 95% confidence level) for this test is ± 1.3 dB.

Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test using Biconical antenna is ± 4.5 dB(3m)/ ± 4.7 dB(10m).

The measurement uncertainty (with a 95% confidence level) for this test using Logperiodic antenna is ± 5.2 dB(3m)/ ± 3.8 dB(10m).

The measurement uncertainty (with a 95% confidence level) for this test using Horn antenna is ± 6.6 dB.

Other test except Conducted Emission and Spurious Emission (Radiated)

The measurement uncertainty (with a 95% confidence level) for this test is ± 3.0 dB.

*These tests were also referred to FCC Public Notice DA 00-705 "Guidance on Measurement for Frequency Hopping Spread Spectrum Systems".

*These tests were performed without any deviations from test procedure except for additions or exclusions.

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

3.3 Addition or deviations to standards

Addition

No.	Item	Test Procedure	Specification	Remarks	Deviation	Worst margin	Results
1	99% Occupied Band Width	RSS-210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004	RSS-210(issue 5): 2001 + Amendment:2002 + Amendment2:2003 + Amendment3:2004	Conducted	N/A	N/A	N/A

3.4 Test Location

UL Apex Co., Ltd. Head Office EMC Lab. *NVLAP Lab. code: 200572-0

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

	Listed date (for FCC)	FCC Registration Number	IC Registration Number	Width x Depth x Height (m)	Size of reference ground plane (m) / horizontal conducting plane	Other rooms
No.1 semi-anechoic chamber	February 01, 2002	313583	IC4247	19.2 x 11.2 x 7.7m	7.0 x 6.0m	Preparation room
No.2 semi-anechoic chamber	June 05, 2002	846015	IC4247-2	7.5 x 5.8 x 5.2m	4.0 x 4.0m	-
No.3 shielded room	-	-	-	4.7 x 7.5 x 2.7m	4.7 x 7.5m	-
No.4 measurement room	-	-	-	3.1 x 5.0 x 2.7m	N/A	-

* Size of vertical conducting plane (for Conducted Emission test) : 2.0 x 2.0m for No.1 and No.2 semi-anechoic and No.3 shielded room.

3.5 Test set up, Test instruments and Data of EMI

Refer to APPENDIX 1 to 3.

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

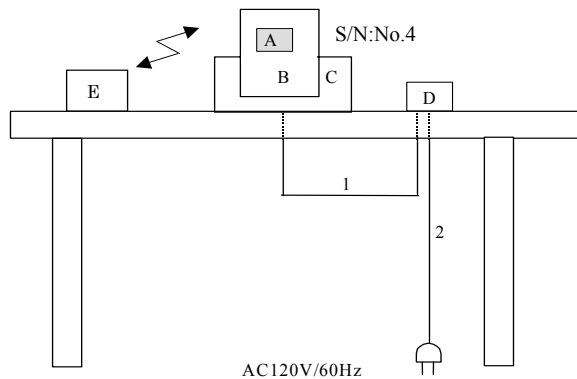
SECTION 4: Operation of E.U.T. during testing

4.1 Operating Modes

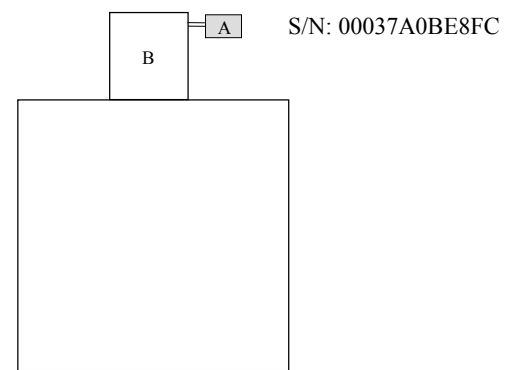
The mode is used : [FHSS:Bluetooth]
Transmitting mode(Packet size DH1/DH3/DH5)
Low Channel :2402MHz
Mid Channel :2441MHz
High channel :2480MHz
Inquiry

4.2 Configuration and peripherals

AC Conducted emission test



Other tests except for the AC Conducted emission test



* Cabling was taken into consideration and test data was taken under worse case conditions.

Description of EUT and Support equipment

No.	Item	Model number	Serial number	Manufacturer	FCC ID	Remark
A	Bluetooth Board	DWBT003	No.4(for the AC main conducted test) 00037A0BE8FC(for the Radiated emission and Antenna terminal conducted test)	DENSO WAVE INCORPORATED	PZWDWBT003	EUT
B	Barcode Handy Terminal	BHT-300BB	-	DENSO WAVE INCORPORATED	-	EUT's Pair
C	Optical Communication Unit	CU-301	5496320075	DENSO WAVE INCORPORATED	-	-
D	AC Adaptor	454865-0340	3423823	DENSO WAVE INCORPORATED	-	-
E	Barcode Handy Terminal	BHT-300BB	-	DENSO WAVE INCORPORATED	-	-

List of cables used

No.	Name	Length (m)	Shield	Backshell Material
1	DC Cable	1.9	N	Polyvinyl chloride
2	AC Cable	1.9	N	Polyvinyl chloride

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

SECTION 5: Conducted Emission

Test Procedure and conditions

EUT was placed on a platform of nominal size, 1m by 1.5m, raised 80cm above the conducting ground plane. The rear of tabletop was located 40cm to the vertical conducting plane. The rear of EUT, including peripherals aligned and flushed with rear of tabletop. All other surfaces of tabletop were at least 80cm from any other grounded conducting surface. EUT was located 80cm from a Line Impedance Stabilization Network (LISN)/ Artificial mains Network (AMN) and excess AC cable was bundled in center.

1) For the tests on EUT with other peripherals (as a whole system)

I/O cable and AC cables that were connected to the peripherals were bundled in center. They were folded back and forth forming a bundle 30cm to 40cm long and were hanged at a 40cm height to the ground plane.

The AC Mains Terminal Continuous disturbance Voltage has been measured with the EUT in a Semi Anechoic Chamber or a Measurement Room.

The EUT was connected to a LISN (AMN).

An overview sweep with peak detection has been performed.

Detector	: CISPR quasi-peak detector (IF BW 9 kHz)
Measurement range	: 0.15-30MHz
Test data	: APPENDIX 3
Test result	: Pass

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

SECTION 6: Spurious Emission

[Conducted]

Test Procedure

The Out of Band Emission was measured with a spectrum analyzer connected to the antenna port.

Test data : APPENDIX 3

Test result : Pass

[Radiated]

Test Procedure

EUT was placed on a platform of nominal size, 0.5m by 0.5m, raised 80cm above the conducting ground plane. The Radiated Electric Field Strength intensity has been measured in a Semi Anechoic Chamber with a ground plane and at a distance of 3m(Below 10GHz) and 1m(Upper 10GHz).

The height of the measuring varied between 1 and 4m and EUT was rotated a full revolution in order to obtain the maximum value of the electric field intensity.

The measurements were performed for both vertical and horizontal antenna polarization with the Test Receiver or the Spectrum Analyzer.

In any 100kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator confirmed 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on a radiated measurement.

Test data : APPENDIX 3

Test result : Pass

20dBc was applied to the frequency over the limit of FCC 15.209 and outside the restricted band of 15.205.

Frequency	Below 1GHz	Above 1GHz
Instrument used	Test Receiver / Spectrum Analyzer	Spectrum Analyzer
Detector	QP: BW 120kHz(T/R)	PK: RBW:1MHz/VBW: 1MHz
IF Bandwidth	20dBc : RBW: 100kHz VBW: 300kHz (S/A)	AV: RBW:1MHz/VBW:10Hz 20dBc : RBW:100kHz/VBW:300kHz

- The carrier level (or, noise levels) was (or were) measured at each position of all three axes X, Y and Z, and the position that has the maximum noise was determined.

With the position, the noise levels of all the frequencies was measured.

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

SECTION 7: Bandwidth

Test Procedure

The bandwidth was measured with a spectrum analyzer connected to the antenna port.

Test data	: APPENDIX 3
Test result	: Pass

SECTION 8: Maximum Peak Output Power

Test Procedure

The test was made with the spectrum analyzer that has a function of channel-power measurements.
The Maximum Peak Output Power was measured with a spectrum analyzer connected to the antenna port.

Test data	: APPENDIX 3
Test result	: Pass

SECTION 9: Carrier Frequency Separation

Test Procedure

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna port.

Test data	: APPENDIX 3
Test result	: Pass

SECTION 10: Number of Hopping Frequency

Test Procedure

The Number of Hopping Frequency was measured with a spectrum analyzer connected to the antenna port.

Test data	: APPENDIX 3
Test result	: Pass

SECTION 11: Dwell time

Test Procedure

The Dwell time was measured with a spectrum analyzer connected to the antenna port.

Test data	: APPENDIX 3
Test result	: Pass

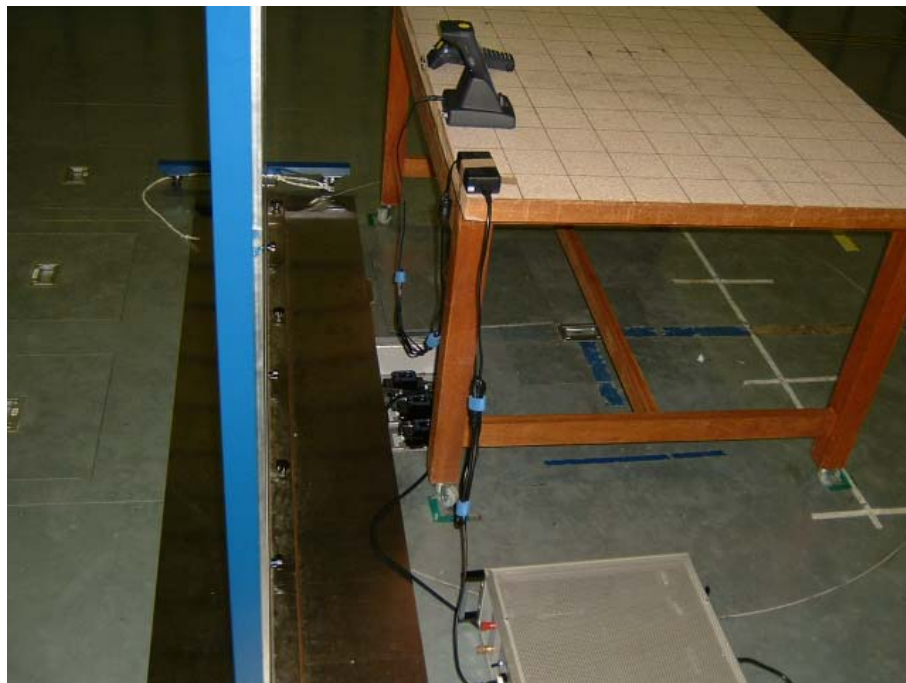
APPENDIX 1: Photographs of test setup

Conducted Emission

Front



Rear

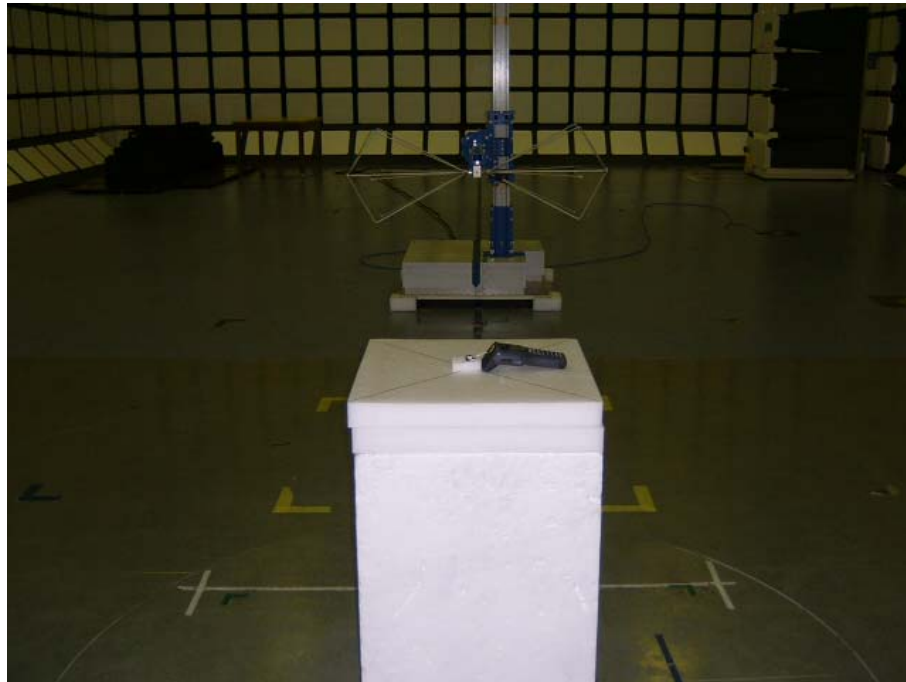


Spurious Emission (Radiated)

Front



Rear



Worst Case Position (Z-axis:Horizontal / Y-axis:Vertical)

X-axis



Y-axis



Z-axis



APPENDIX 2:Test instruments

EMI test equipment

All equipment is calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

Control No.	Instrument	Manufacturer	Model No	Test Item	Calibration Date * Interval(month)
MCC-23	Microwave Cable	Storm	-	2 / 3	2004/05/01 * 12
MAEC-01	Anechoic Chamber	TDK	Semi Anechoic Chamber 10m	1 / 3	2003/12/27 * 12
MCC-01	Coaxial Cable	Suhner/storm/Agilent /TSJ	-	3	2003/12/19 * 12
MCC-03	Coaxial Cable	Fujikura/Suhner/Agile nt/TSJ	-	1	2003/12/24 * 12
MBA-01	Biconical Antenna	Schwarzbeck	BBA9106	3	2003/10/15 * 12
MLA-01	Logperiodic Antenna	Schwarzbeck	USLP9143	3	2003/10/15 * 12
MAT-06	Attenuator(6dB)	Weinschel Corp	2	3	2003/12/16 * 12
MTR-01	Test Receiver	Rohde & Schwarz	ESI40	1 / 2 / 3	2003/11/12 * 12
MLS-02	LISN(AMN)	Schwarzbeck	NSLK8127	1	2003/11/10 * 12
MHA-01	Horn Antenna	EMCO	3160-09	3	2004/01/10 * 12
MHA-05	Horn Antenna	Schwarzbeck	BBHA9120D	3	2004/01/10 * 12
MPA-01	Pre Amplifier	Agilent	8449B	3	2004/02/06 * 12
MCC-05	Microwave Cable	Storm	421-011	3	2004/01/06 * 12
MPA-04	Pre Amplifier	Agilent	8447D	3	2004/05/25 * 12

1: AC Main Conducted Emission

2: Antenna Terminal Conducted

3: Radiated Spurious Emission

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

APPENDIX 3: Data of EMI test

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

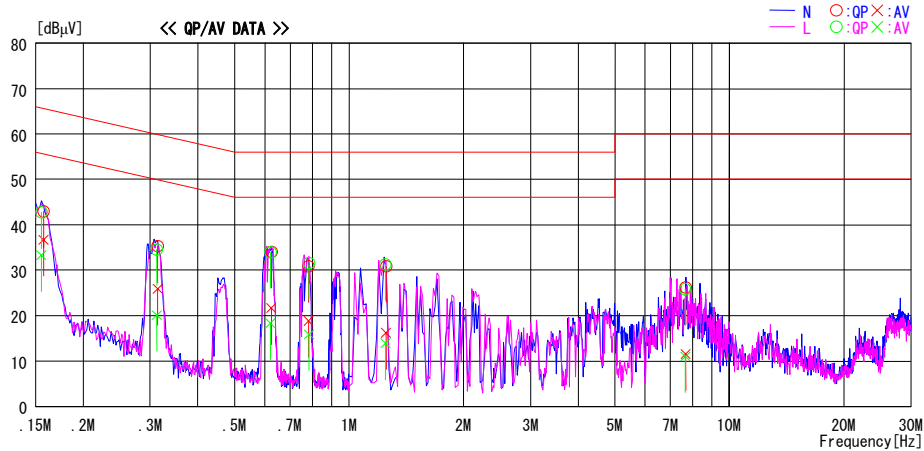
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/09/16 02:01:07

Applicant : DENSO
Kind of EUT : Bluetooth Board
Model No. : DWBT003
Serial No. : No. 4

Report No. : 24AE0222-HO
Power : AC120V
Temp°C/Humi% : 25deg. C / 53%
Operator : Naoki Sakamoto

Mode / Remarks : Loopback Mode

LIMIT : FCC15C § 15.207 (QP)
FCC15C § 15.207 (AV)



NO	FREQ [MHz]	READING		C. F	RESULT		LIMIT		MARGIN		PHASE
		QP [dBμV]	AV [dBμV]		QP [dBμV]	AV [dBμV]	QP [dBμV]	AV [dBμV]	QP [dB]	AV [dB]	
1	0.1572	42.9	36.6	0.1	43.0	36.7	65.6	55.6	22.6	18.9	N
2	0.3137	35.1	25.7	0.2	35.3	25.9	59.9	49.9	24.6	24.0	N
3	0.6246	33.6	21.2	0.5	34.1	21.7	56.0	46.0	21.9	24.3	N
4	0.7824	30.4	18.3	0.5	30.9	18.8	56.0	46.0	25.1	27.2	N
5	1.2513	30.5	15.8	0.4	30.9	16.2	56.0	46.0	25.1	29.8	N
6	7.6721	25.4	10.7	0.8	26.2	11.5	60.0	50.0	33.8	38.5	N
7	0.1551	42.7	33.2	0.1	42.8	33.3	65.7	55.7	22.9	22.4	L
8	0.3121	34.4	19.9	0.2	34.6	20.1	59.9	49.9	25.3	29.8	L
9	0.6210	33.5	17.8	0.5	34.0	18.3	56.0	46.0	22.0	27.7	L
10	0.7847	31.1	15.4	0.5	31.6	15.9	56.0	46.0	24.4	30.1	L
11	1.2473	30.8	13.4	0.5	31.3	13.9	56.0	46.0	24.7	32.1	L
12	7.6562	25.0	10.2	0.8	25.8	11.0	60.0	50.0	34.2	39.0	L

CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

Conducted Emission

DATA OF CONDUCTED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/09/16 02:35:50

Applicant : DENSO
Kind of EUT : Bluetooth Board
Model No. : DWBT003
Serial No. : No. 4

Report No. : 24AE0222-H0
Power : AC120V
Temp°C/Humi% : 25deg.C / 53%
Operator : Naoki Sakamoto

Mode / Remarks : Standby Mode

LIMIT : FCC15C § 15.207 (QP)
FCC15C § 15.207 (AV)

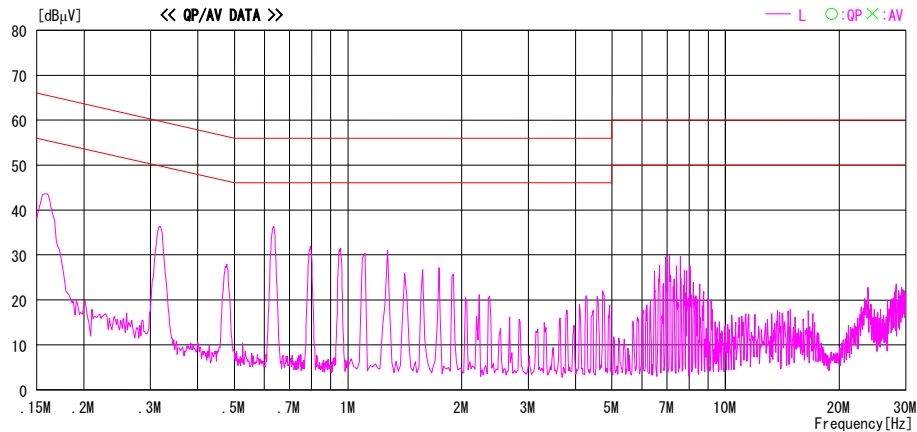
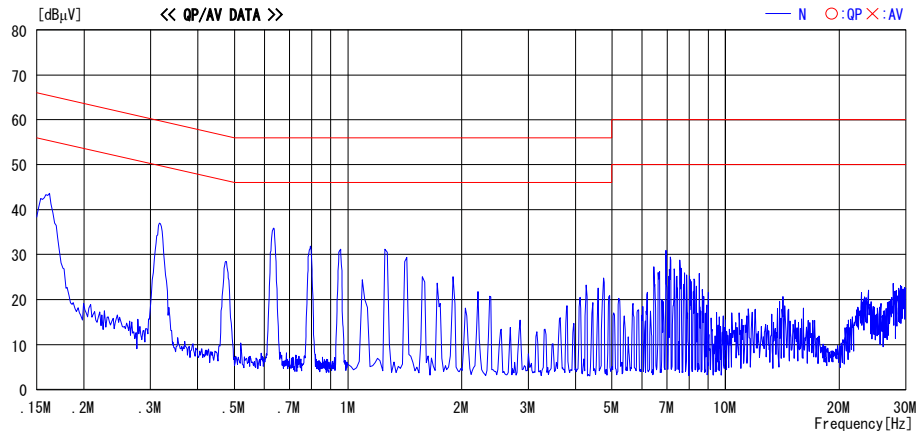


CHART:WITH FACTOR,Peak hold data.Data is uncorrected. CALCURATION:RESULT=READING+C.F(LISN LOSS+CABLE LOSS)
Except for the above table : adequate margin data below the limits.

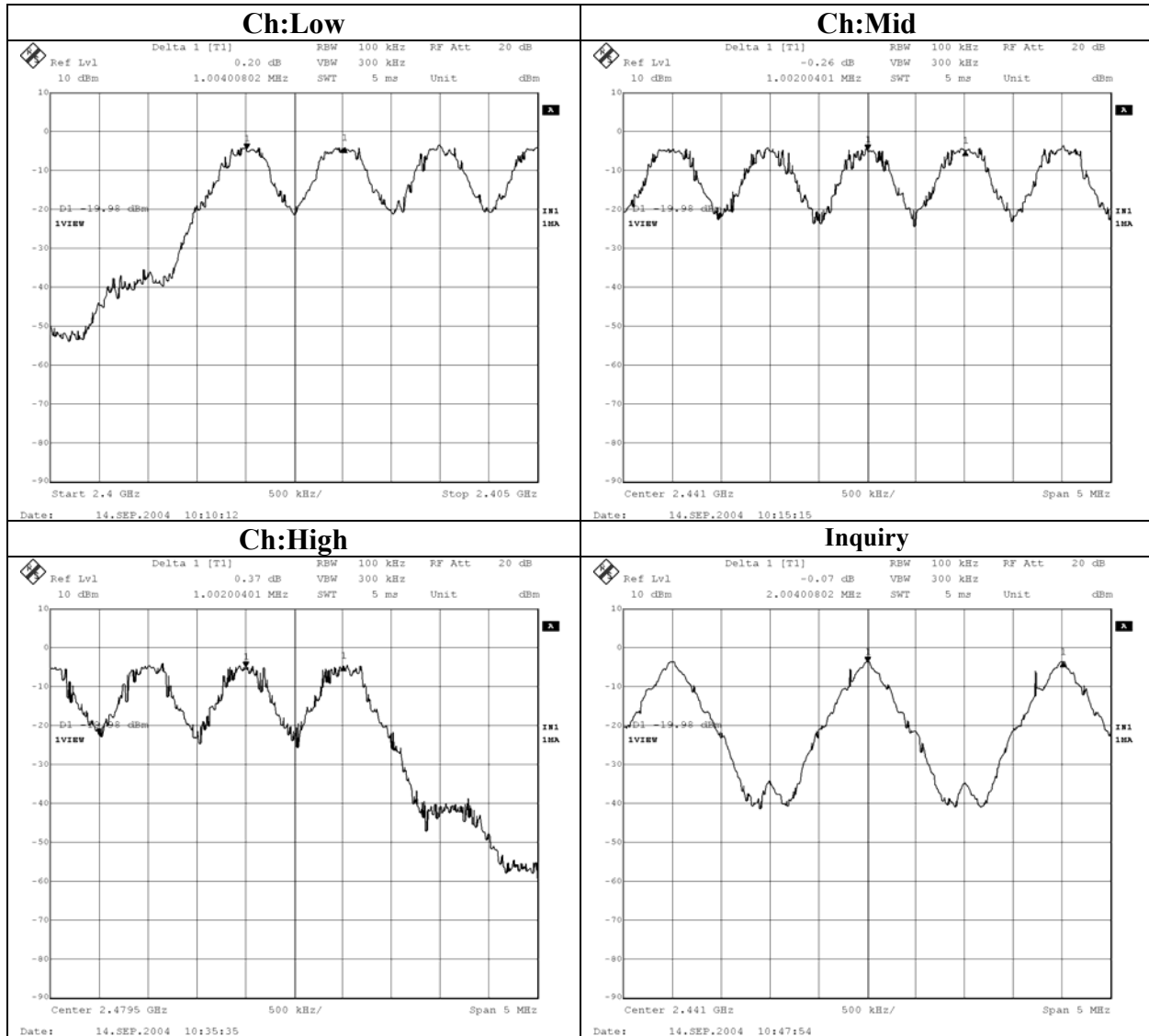
Carrier Frequency Separation(FHSS)

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: DENSO	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Bluetooth Board	TEST DISTANCE	: -
MODEL	: DWBT003	DATE	: 09/14/2004
S/ N	: 00037A0BE8FC	TEMPERATURE	: 24deg.C
POWER	: AC120V/60Hz(AC Adaptor)	HUMIDITY	: 51%
MODE	: Tx(Hopping on)/Inquiry	ENGINEER	: Naoki Sakamoto

Ch	Freq. [MHz]	Channel separation [MHz]	Limit
Low	2402.0	1.004	>20dB Bandwidth and 25[kHz]
Mid	2441.0	1.002	>20dB Bandwidth and 25[kHz]
High	2480.0	1.002	>20dB Bandwidth and 25[kHz]
Inquiry	2441.0	2.004	>20dB Bandwidth and 25[kHz]

Carrier Frequency Separation(FHSS)



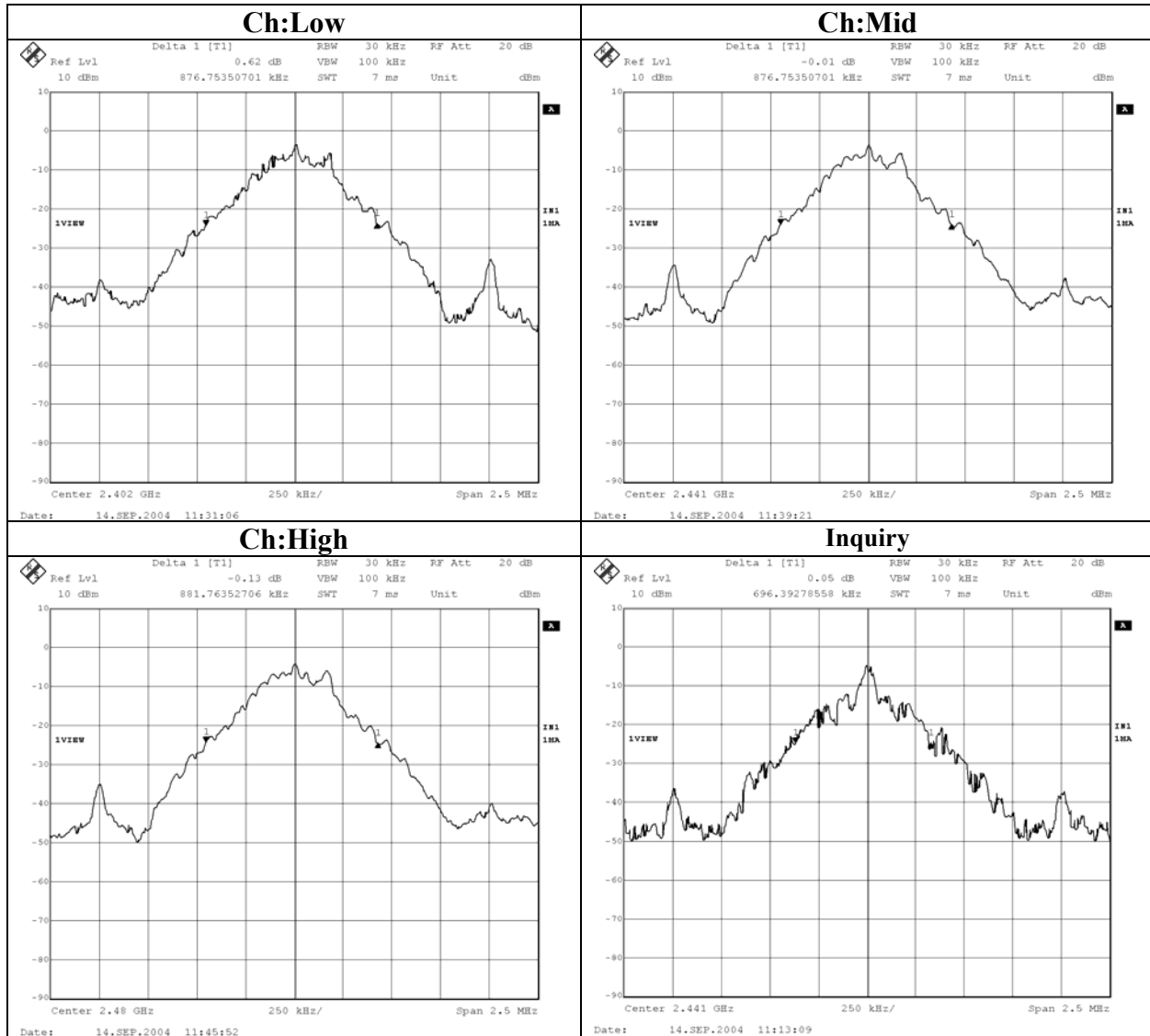
20dB Bandwidth(FHSS)

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: DENSO	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Bluetooth Board	TEST DISTANCE	: -
MODEL	: DWBT003	DATE	: 09/14/2004
S/ N	: 00037A0BE8FC	TEMPERATURE	: 24deg.C
POWER	: AC120V/60Hz(AC Adaptor)	HUMIDITY	: 51%
MODE	: Tx (Hopping off) /Inquiry	ENGINEER	: Naoki Sakamoto

Ch	Freq. [MHz]	20dB Bandwidth [MHz]	Limit [MHz]
Low	2402.0	0.876	-
Mid	2441.0	0.876	-
High	2480.0	0.881	-
Inquiry	2441.0	0.696	-

20dB Bandwidth(FHSS)



Number of Hopping Frequency(FHSS)

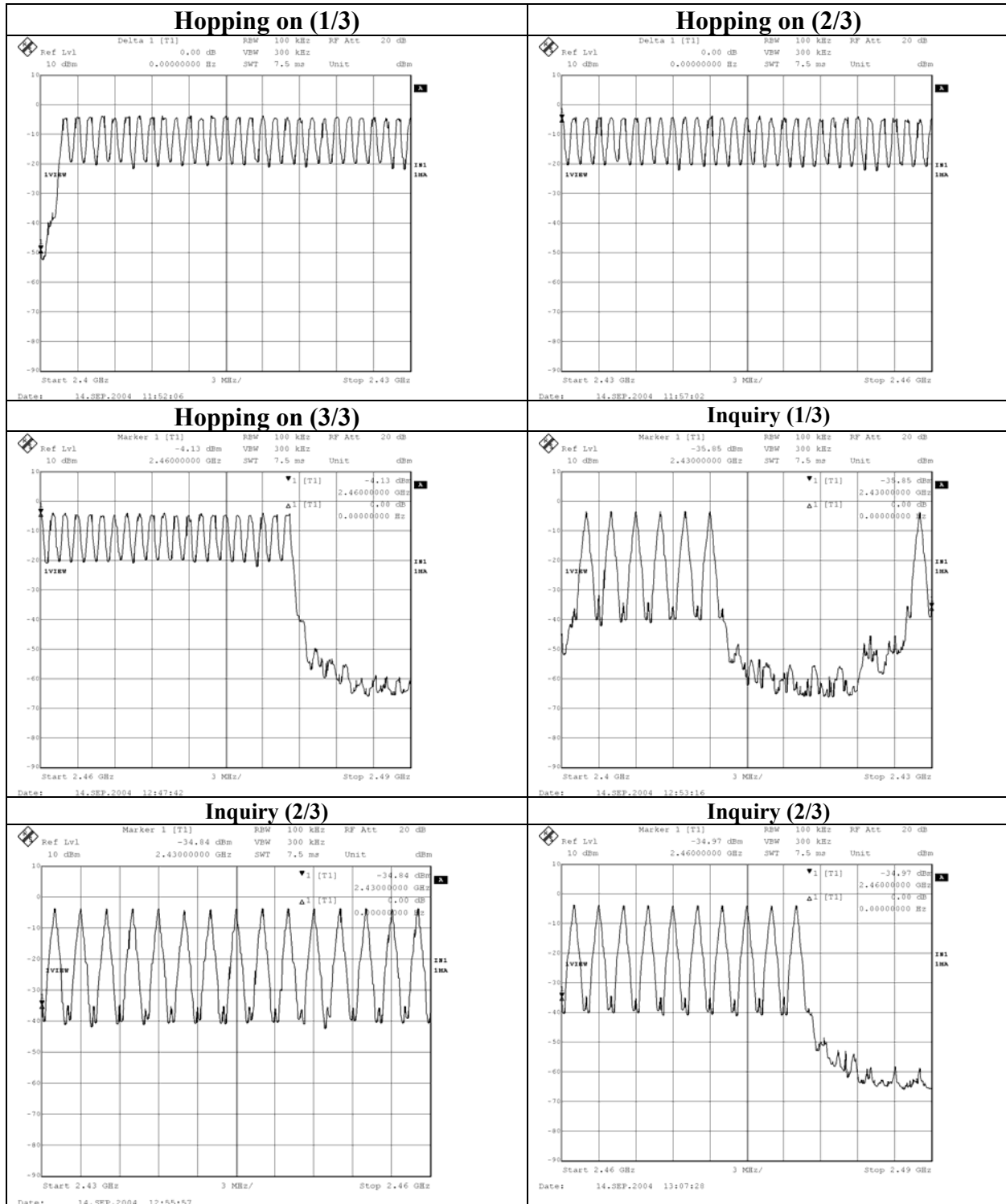
UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: DENSO	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT	: Bluetooth Board	TEST DISTANCE	: -
MODEL	: DWBT003	DATE	: 09/14/2004
S/ N	: 00037A0BE8FC	TEMPERATURE	: 24xdeg.C
POWER	: AC120V/60Hz(AC Adaptor)	HUMIDITY	: 51%
MODE	: Tx (Hopping on) /Inquiry	ENGINEER	: Naoki Sakamoto

Mode	Number of channel	Limit
	[time]	[time]
Tx(Hoppng on)	79	≥ 15

Mode	Number of channel	Limit
	[time]	[time]
Inquiry	32	≥ 15

Number of Hopping Frequency(FHSS)



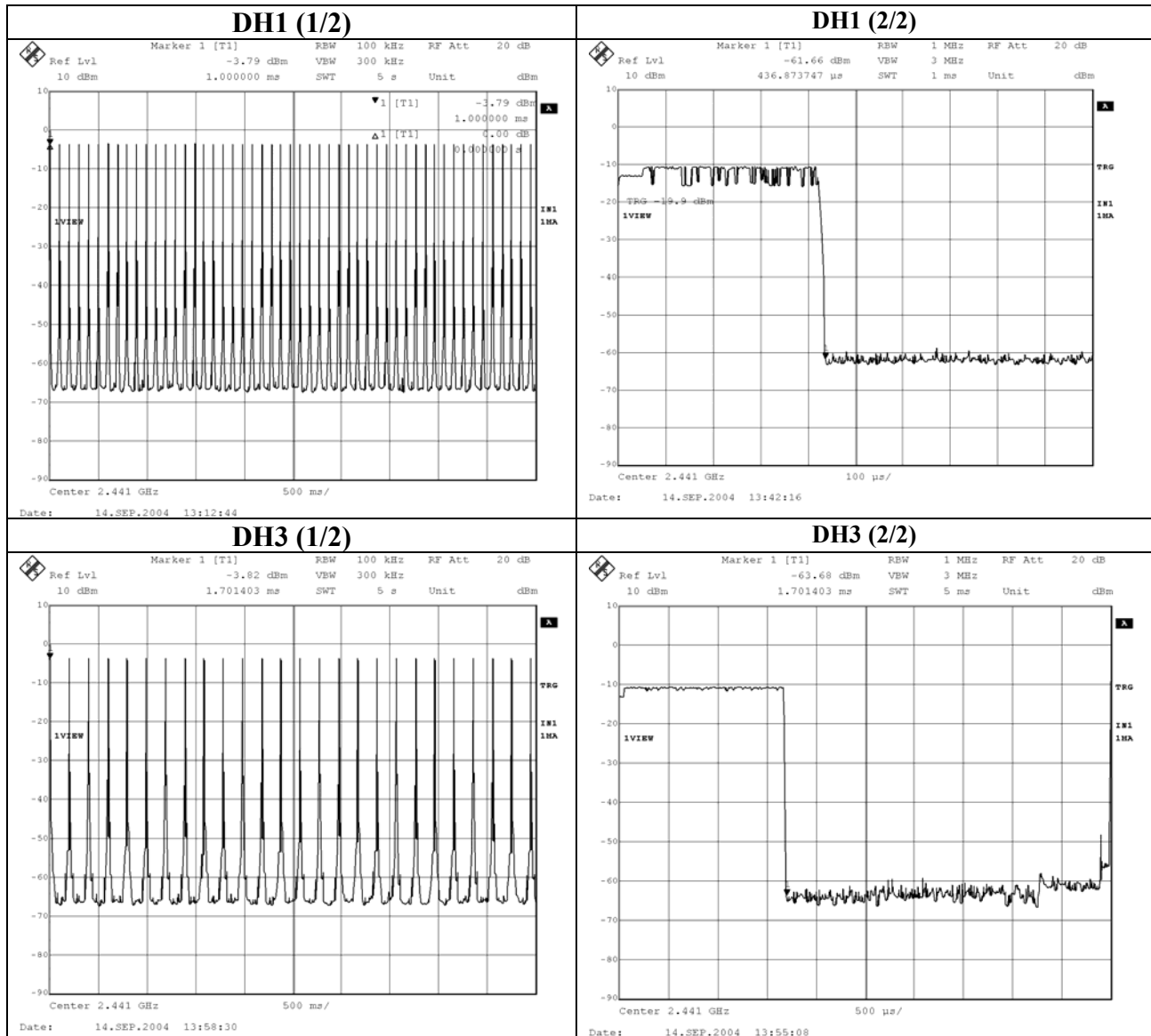
Dwell time(FHSS)

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

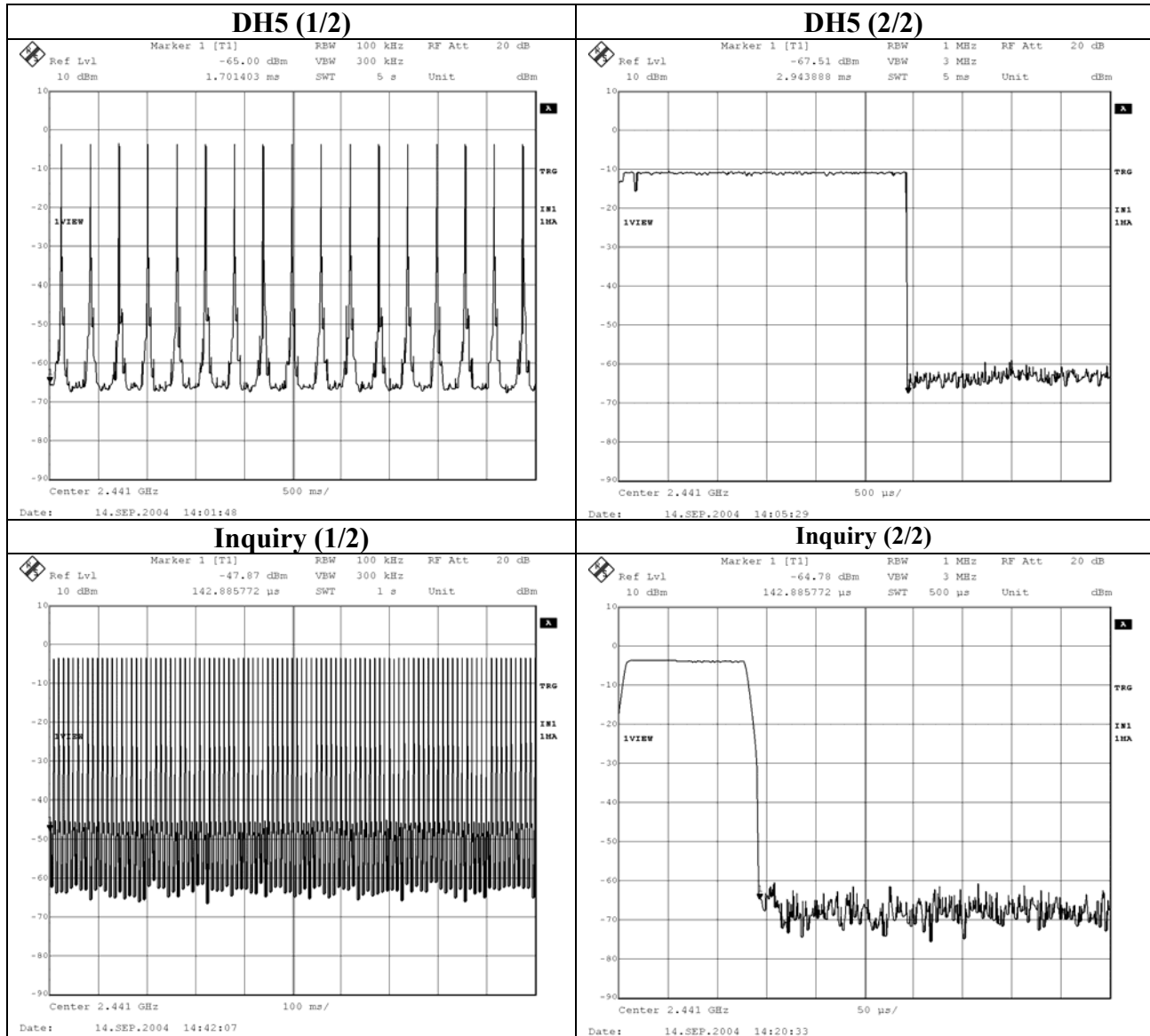
COMPANY	: DENSO	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)(iii)
EQUIPMENT	: Bluetooth Board	TEST DISTANCE	: -
MODEL	: DWBT003	DATE	: 09/14/2004
S/ N	: 00037A0BE8FC	TEMPERATURE	: 24deg.C
POWER	: AC120V/60Hz(AC Adaptor)	HUMIDITY	: 51%
MODE	: Tx (Hopping on) /Inquiry	ENGINEER	: Naoki Sakamoto

Mode	Number of transmission in a 31.6(79 Hopping x 0.4) / 12.8(32 Hopping x 0.4)second period	Length of transmission time [msec]	Result [msec]	Limit [msec]
DH1	51 times /5sec. x 31.6 = 322 times	0.436	140	400
DH3	26 times / 5sec. x 31.6 = 164 times	1.701	278	400
DH5	17 times / 5 sec. x 31.6 = 107 times	2.943	314	400
Inquiry	100 times / 1sec. x 12.8 = 1280 times	0.142	181	400

Dwell time(FHSS)



Dwell time(FHSS)



Maximum Peak Output Power(FHSS)

UL Apex Co., Ltd.
Head Office EMC Lab. No.3 Measurement Room

COMPANY	: DENSO	REGULATION	: Fcc Part15 Subpart C 15.247(a)(1)
EQUIPMENT	: Bluetooth Board	TEST DISTANCE	: -
MODEL	: DWBT003	DATE	: 09/14/2004
S/ N	: 00037A0BE8FC	TEMPERATURE	: 21deg.C
POWER	: AC120V/60Hz(AC Adaptor)	HUMIDITY	: 54%
MODE	: Tx(Hopping on)/Inquiry	ENGINEER	: Naoki Sakamoto

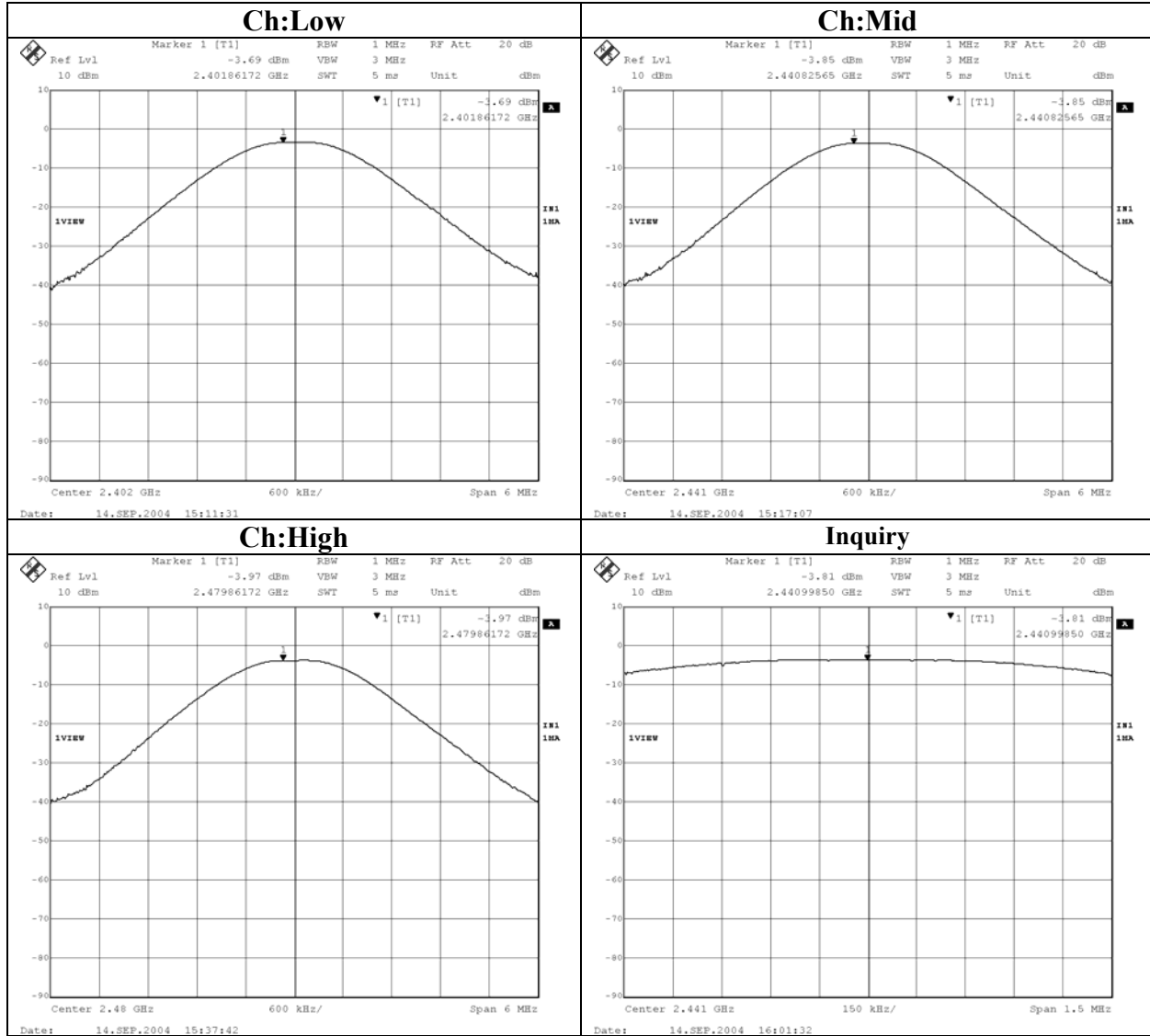
Ch	Freq. [MHz]	S/A Reading [dBm]	Cable Loss [dB]	Atten. [dB]	Result [dBm]	Limit (1W) [dBm]	Margin [dB]
Low	2402.0	-3.69	3.60	0.00	-0.09	30.00	30.09
Mid	2441.0	-3.85	3.60	0.00	-0.25	30.00	30.25
High	2480.0	-3.97	3.60	0.00	-0.37	30.00	30.37
Inquiry	2441.0	-3.81	3.60	0.00	-0.21	21.00	21.21

Sample Calculation:

Result = Reading + Cable Loss (supplied by customer) + Attenuator

* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

Maximum Peak Output Power(FHSS)



Radiated Spurious Emission(FHSS)

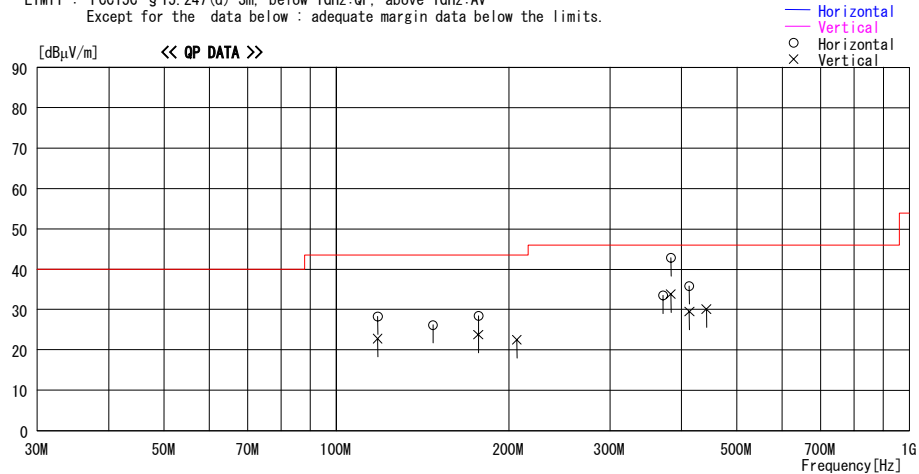
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/09/16 19:22:23

Applicant : DENSO
Kind of EUT : Bluetooth Board
Model No. : DWBT003
Serial No. : 00037A0BE8FC
Report No. : 24AE0222-HO
Power : DC3.3V
Temp°C/Humi% : 24 / 57
Operator : Naoki Sakamoto

Mode / Remarks : Tx2402MHz / Max-axis

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	117.959	34.9	12.8	8.1	27.5	28.3	43.5	15.2	273	0
2	147.456	30.8	14.5	8.6	27.7	26.2	43.5	17.3	319	180
3	176.948	31.1	16.0	8.9	27.6	28.4	43.5	15.1	245	7
4	371.465	33.3	17.1	10.6	27.5	33.5	46.0	12.5	100	346
5	383.388	42.1	17.6	10.7	27.6	42.8	46.0	3.2	100	6
6	412.895	34.8	18.2	10.8	28.0	35.8	46.0	10.2	100	359
----- Vertical -----										
7	117.960	29.4	12.8	8.1	27.5	22.8	43.5	20.7	222	110
8	176.940	26.5	16.0	8.9	27.6	23.8	43.5	19.7	116	102
9	206.431	23.4	17.0	9.3	27.2	22.5	43.5	21.0	100	98
10	383.397	33.1	17.6	10.7	27.6	33.8	46.0	12.2	271	263
11	412.885	28.5	18.2	10.8	28.0	29.5	46.0	16.5	249	282
12	442.376	29.3	18.1	10.8	28.1	30.1	46.0	15.9	216	268

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN
Page:

Radiated Spurious Emission(FHSS)

DATA OF RADIATED EMISSION TEST

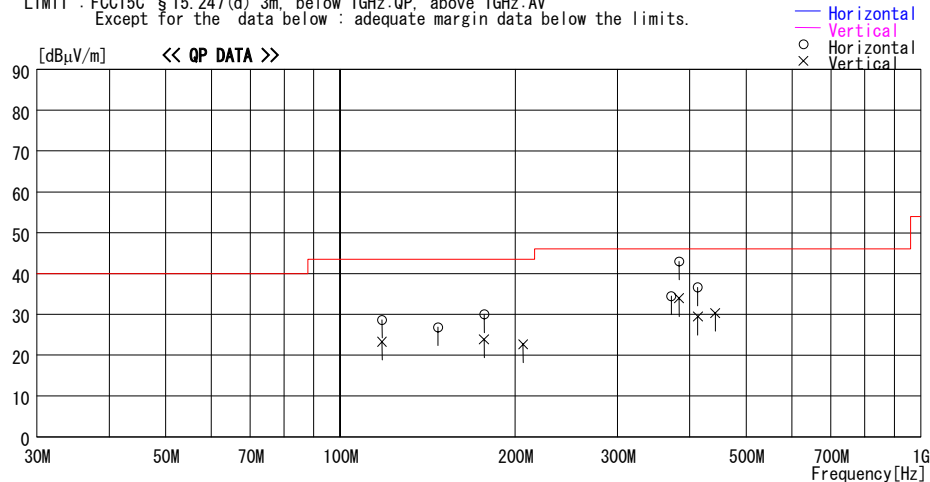
UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/09/16 20:42:08

Applicant : DENSO
Kind of EUT : Bluetooth Board
Model No. : DWBT003
Serial No. : 00037A0BE8FC

Report No. : 24AE0222-H0
Power : DC3.3V
Temp°C/Humi% : 24 / 57
Operator : Naoki Sakamoto

Mode / Remarks: Tx2441MHz / Max-axis

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	117.960	35.3	12.8	8.1	27.5	28.7	43.5	14.8	267	4
2	147.458	31.4	14.5	8.6	27.7	26.8	43.5	16.7	277	189
3	176.943	32.7	16.0	8.9	27.6	30.0	43.5	13.5	173	1
4	371.435	34.2	17.1	10.6	27.5	34.4	46.0	11.6	100	348
5	383.382	42.2	17.6	10.7	27.6	42.9	46.0	3.1	100	0
6	412.889	35.6	18.2	10.8	28.0	36.6	46.0	9.4	100	3
----- Vertical -----										
7	117.960	29.9	12.8	8.1	27.5	23.3	43.5	20.2	238	99
8	176.954	26.6	16.0	8.9	27.6	23.9	43.5	19.6	112	104
9	206.446	23.6	17.0	9.3	27.2	22.7	43.5	20.8	100	94
10	383.392	33.3	17.6	10.7	27.6	34.0	46.0	12.0	282	267
11	412.886	28.4	18.2	10.8	28.0	29.4	46.0	16.6	242	289
12	442.378	29.5	18.1	10.8	28.1	30.3	46.0	15.7	242	278

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS (CABLE+ATTEN.) - AMP. GAIN

Page:

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

Radiated Spurious Emission(FHSS)

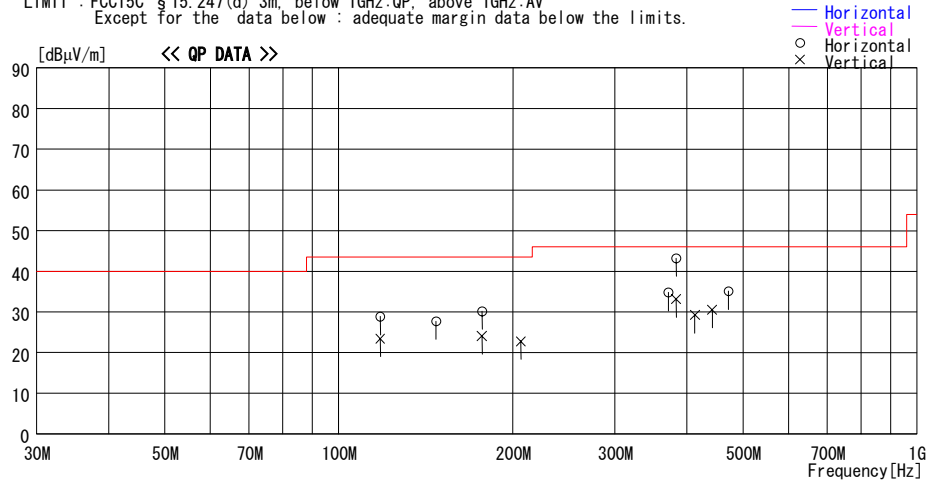
DATA OF RADIATED EMISSION TEST

UL Apex Co., Ltd. Head Office EMC Lab. No.1 Semi Anechoic Chamber
Date : 2004/09/16 21:23:08

Applicant : DENSO
Kind of EUT : Bluetooth Board
Model No. : DWBT003
Serial No. : 00037A0BE8FC
Report No. : 24AE0222-H0
Power : DC3.3V
Temp°C/Humi% : 24 / 57
Operator : Naoki Sakamoto

Mode / Remarks: Tx2480MHz / Max-axis

LIMIT : FCC15C §15.247(d) 3m, below 1GHz:QP, above 1GHz:AV
Except for the data below : adequate margin data below the limits.



No.	FREQ [MHz]	READING QP [dBμV]	ANT FACTOR [dB/m]	LOSS [dB]	GAIN [dB]	RESULT [dBμV/m]	LIMIT [dBμV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	117.969	35.4	12.8	8.1	27.5	28.8	43.5	14.7	274	3
2	147.465	32.3	14.5	8.6	27.7	27.7	43.5	15.8	206	183
3	176.954	32.9	16.0	8.9	27.6	30.2	43.5	13.3	176	2
4	371.435	34.6	17.1	10.6	27.5	34.8	46.0	11.2	100	355
5	383.405	42.5	17.6	10.7	27.6	43.2	46.0	2.8	100	359
6	471.884	34.6	18.0	11.0	28.5	35.1	46.0	10.9	100	0
----- Vertical -----										
7	117.963	30.0	12.8	8.1	27.5	23.4	43.5	20.1	239	93
8	176.954	26.8	16.0	8.9	27.6	24.1	43.5	19.4	107	97
9	206.445	23.7	17.0	9.3	27.2	22.8	43.5	20.7	120	102
10	383.391	32.4	17.6	10.7	27.6	33.1	46.0	12.9	286	241
11	412.890	28.2	18.2	10.8	28.0	29.2	46.0	16.8	237	297
12	442.395	29.7	18.1	10.8	28.1	30.5	46.0	15.5	239	264

CHART:WITHOUT FACTOR ANT TYPE : -30MHz LOOP, 30-300MHz BICONICAL, 300MHz-1000MHz LOGPERIODIC, 1000MHz- HORN
CALCULATION : READING + ANT FACTOR + LOSS(CABLE+ATTEN.) - AMP. GAIN
Page:

Radiated Spurious Emission(FHSS)

COMPANY : DENSO EQUIPMENT : Bluetooth Board MODEL : DWBT003 S/ N : 00037A0BE8FC POWER : DC3.3V MODE : Tx (2402MHz) AXIS : Hor: Z-axis, Ver: Y-axis	UL Apex Co., Ltd.	Head Office EMC Lab. No.1 Semi Anechoic Chamber REGULATION : FCC Part 15 Subpart C 15.247(d) TEST DISTANCE : 3 and 1m DATE : 17/09/2004 TEMPERATURE : 24deg.C HUMIDITY : 57% ENGINEER : Naoki Sakamoto
--	-------------------	--

PK DETECT (RBW: 1MHz, VBW:1MHz)

No.	Freq. [MHz]	Reading HOR VER [dBuV]		Ant. Factor [dB/m]	Amp. Gain [dB]	Cable Loss [dB]	Atten. or Filter [dB]	Result HOR VER [dBuV/m]		Limit PK [dBuV/m]	Margin HOR VER [dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	1201.5	53.1	50.1	23.1	36.9	3.8	0.0	43.1	40.1	74.0	30.9	33.9
2	2390.0	46.9	46.6	30.7	36.3	5.6	0.0	46.9	46.6	74.0	27.1	27.4
3	4804.2	46.9	44.7	35.1	36.1	8.0	0.0	53.9	51.7	74.0	20.1	22.3
4	7206.0	44.5	44.6	37.6	35.6	10.1	0.0	56.6	56.7	74.0	17.4	17.3
5	9608.0	44.3	44.2	37.1	36.3	11.9	0.0	57.0	56.9	74.0	17.0	17.1
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter) - Dfac												
6	12010.0	44.9	44.6	40.5	35.7	4.0	0.0	53.7	53.4	74.0	20.3	20.6
7	14412.0	44.6	45.0	41.9	34.6	5.2	0.0	57.1	57.5	74.0	16.9	16.5
8	16814.0	44.5	44.1	46.1	35.6	7.1	0.0	62.1	61.7	74.0	11.9	12.3
9	19216.0	44.0	43.6	42.1	34.9	8.3	0.0	59.5	59.1	74.0	14.5	14.9
10	21618.0	44.4	43.5	40.8	35.4	10.2	0.0	60.0	59.1	74.0	14.0	14.9
11	24020.0	44.1	43.9	41.0	35.8	11.0	0.0	60.3	60.1	74.0	13.7	13.9

AV DETECT (RBW: 1MHz, VBW:10Hz)

No.	Freq. [MHz]	Reading HOR VER [dBuV]		Ant. Factor [dB/m]	Amp. Gain [dB]	Cable Loss [dB]	Atten. or Filter [dB]	Result HOR VER [dBuV/m]		Limit AV [dBuV/m]	Margin HOR VER [dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	1201.5	49.6	45.9	23.1	36.9	3.8	0.0	39.6	35.9	54.0	14.4	18.1
2	2390.0	33.2	32.8	30.7	36.3	5.6	0.0	33.2	32.8	54.0	20.8	21.2
3	4804.2	37.1	32.1	35.1	36.1	8.0	0.0	44.1	39.1	54.0	9.9	14.9
4	7206.0	31.7	32.0	37.6	35.6	10.1	0.0	43.8	44.1	54.0	10.2	9.9
5	9608.0	31.2	31.2	37.1	36.3	11.9	0.0	43.9	43.9	54.0	10.1	10.1
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter) - Dfac												
6	12010.0	31.1	31.2	40.5	35.7	4.0	0.0	39.9	40.0	54.0	14.1	14.0
7	14412.0	30.5	30.5	41.9	34.6	5.2	0.0	43.0	43.0	54.0	11.0	11.0
8	16814.0	30.2	30.4	46.1	35.6	7.1	0.0	47.8	48.0	54.0	6.2	6.0
9	19216.0	30.4	30.4	42.1	34.9	8.3	0.0	45.9	45.9	54.0	8.1	8.1
10	21618.0	31.2	31.3	40.8	35.4	10.2	0.0	46.8	46.9	54.0	7.2	7.1
11	24020.0	31.3	31.3	41.0	35.8	11.0	0.0	47.5	47.5	54.0	6.5	6.5

20dBc (Fundamental 2402MHz) (RBW : 100KHz, VBW : 300KHz)

No.	Freq. [MHz]	Reading		Ant. Factor [dB/m]	Amp. Gain [dB]	Cable Loss [dB]	Atten. or Filter [dB]	Result		Limit PK [dBuV/m]	Margin	
		HOR [dBuV]	VER					HOR [dBuV/m]	VER		HOR [dB]	VER [dB]
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	2402.0	99.9	97.3	30.7	36.3	5.6	0.0	99.9	97.3	-	-	-
2	2400.0	57.7	55.5	30.7	36.3	5.6	0.0	57.7	55.5	Funda-20dB	22.2	21.8

Test Distance 1.0m : Distance Factor(Dfac) = $20\log(3/1.0) = 9.5 \text{ dB}$

* Except for the above table : All other spurious emissions were less than 20dB for the limit.

* Atten. : 1 to 3.5GHz, Filter : 3.5 to 26GHz * In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

Radiated Spurious Emission (FHSS)

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

COMPANY : DENSO
EQUIPMENT : Bluetooth Board
MODEL : DWBT003
S/N : 00037A0BE8FC
POWER : DC3.3V
MODE : Tx (2441MHz)
AXIS : Hor: Z-axis , Ver: Y-axis

REGULATION : FCC Part 15 Subpart C 15.247(d)
TEST DISTANCE : 3 and 1m
DATE : 16/09/2004
TEMPERATURE : 24deg.C
HUMIDITY : 57%
ENGINEER : Naoki Sakamoto

PK DETECT (RBW: 1MHz , VBW:1MHz)

No.	Freq. [MHz]	Reading		Ant. Factor [dB/m]	Amp. Gain [dB]	Cable Loss [dB]	Atten. or Filter [dB]	Result		Limit PK [dBuV/m]	Margin	
		HOR	VER					HOR	VER		HOR	VER
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	1220.1	52.2	46.4	23.1	36.9	3.8	0.0	42.2	36.4	74.0	31.8	37.6
2	4881.8	47.8	45.8	35.5	36.1	8.1	0.0	55.3	53.3	74.0	18.7	20.7
3	7323.6	44.4	44.1	37.9	35.7	10.2	0.0	56.8	56.5	74.0	17.2	17.5
4	9763.7	44.7	44.4	37.1	36.3	12.0	0.0	57.5	57.2	74.0	16.5	16.8
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter) - Dfac												
5	12205.0	44.3	43.9	41.4	35.6	4.1	0.0	54.2	53.8	74.0	19.8	20.2
6	14646.0	43.3	44.2	42.6	34.8	5.5	0.0	56.6	57.5	74.0	17.4	16.5
7	17087.0	42.8	42.9	46.5	35.4	7.1	0.0	61.0	61.1	74.0	13.0	12.9
8	19528.0	43.9	44.0	41.2	35.0	8.6	0.0	58.7	58.8	74.0	15.3	15.2
9	21969.0	44.2	44.3	41.1	35.0	10.4	0.0	60.7	60.8	74.0	13.3	13.2
10	24410.0	43.8	44.1	41.2	36.6	11.2	0.0	59.6	59.9	74.0	14.4	14.1

AV DETECT (RBW: 1MHz , VBW:10Hz)

No.	Freq. [MHz]	Reading		Ant. Factor [dB/m]	Amp. Gain [dB]	Cable Loss [dB]	Atten. or Filter [dB]	Result		Limit AV [dBuV/m]	Margin	
		HOR [dBuV]	VER					HOR [dBuV/m]	VER		HOR [dB]	VER [dB]
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
.	1220.1	47.3	34.6	23.1	36.9	3.8	0.0	37.3	24.6	54.0	16.7	29.4
2	4881.8	39.0	35.4	35.5	36.1	8.1	0.0	46.5	42.9	54.0	7.5	11.1
3	7323.6	31.3	31.4	37.9	35.7	10.2	0.0	43.7	43.8	54.0	10.3	10.2
4	9763.7	31.0	31.1	37.1	36.3	12.0	0.0	43.8	43.9	54.0	10.2	10.1
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter) - Dfac												
5	12205.0	30.8	30.8	41.4	35.6	4.1	0.0	40.7	40.7	54.0	13.3	13.3
6	14646.0	30.3	30.4	42.6	34.8	5.5	0.0	43.6	43.7	54.0	10.4	10.3
7	17087.0	29.6	29.7	46.5	35.4	7.1	0.0	47.8	47.9	54.0	6.2	6.1
8	19528.0	31.0	31.1	41.2	35.0	8.6	0.0	45.8	45.9	54.0	8.2	8.1
9	21969.0	31.2	31.2	41.1	35.0	10.4	0.0	47.7	47.7	54.0	6.3	6.3
10	24410.0	30.8	31.2	41.2	36.6	11.2	0.0	46.6	47.0	54.0	7.4	7.0

Test Distance 1.0m : Distance Factor(Dfac) = $20\log(3/1.0) = 9.5 \text{ dB}$

* Except for the above table : All other spurious emissions were less than 20dB for the limit.

* Atten. : 1 to 3.5GHz, Filter : 3.5 to 26GHz

* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

* In the frequency over the fifth harmonic, the noise from the EUT was not seen. Its base noise implies the system noise floor.

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

Radiated Spurious Emission (FHSS)

UL Apex Co., Ltd.
Head Office EMC Lab. No.1 Semi Anechoic Chamber

COMPANY : DENSO
EQUIPMENT : Bluetooth Board
MODEL : DWBT003
S/N : 00037A0BE8FC
POWER : DC3.3V
MODE : Tx (2480MHz)
AXIS : Hor: Z-axis, Ver: Y-axis

REGULATION : FCC Part 15 Subpart C 15.247(d)
TEST DISTANCE : 3 and 1m
DATE : 16/09/2004
TEMPERATURE : 24deg.C
HUMIDITY : 57%
ENGINEER : Naoki Sakamoto

PK DETECT (RBW: 1MHz, VBW:1MHz)

No.	Freq. [MHz]	Reading HOR VER [dBuV]		Ant. Factor [dB/m]	Amp. Gain [dB]	Cable Loss [dB]	Atten. or Filter [dB]	Result HOR VER [dBuV/m]		Limit PK [dBuV/m]	Margin HOR VER [dB]		
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)													
1	1239.5	52.3	49.5	23.2	36.9	3.9	0.0	42.5	39.7	74.0	31.5	34.3	
2	2483.5	60.4	57.6	30.8	36.2	5.6	0.0	60.6	57.8	74.0	13.4	16.2	
3	4960.0	48.7	45.8	35.8	36.1	8.2	0.0	56.6	53.7	74.0	17.4	20.3	
4	7440.0	44.1	45.1	38.2	35.7	10.3	0.0	56.9	57.9	74.0	17.1	16.1	
5	9920.0	44.2	44.0	37.0	36.3	12.1	0.0	57.0	56.8	74.0	17.0	17.2	
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter) - Dfac													
6	12400.0	43.9	44.1	42.3	35.5	4.2	0.0	54.9	55.1	74.0	19.1	18.9	
7	14880.0	43.5	42.8	43.0	35.0	5.7	0.0	57.2	56.5	74.0	16.8	17.5	
8	17360.0	43.8	44.0	45.4	35.2	7.2	0.0	61.2	61.4	74.0	12.8	12.6	
9	19840.0	44.3	44.1	41.2	35.3	8.9	0.0	59.1	58.9	74.0	14.9	15.1	
10	22320.0	44.0	43.9	41.4	35.1	10.6	0.0	60.9	60.8	74.0	13.1	13.2	
11	24800.0	44.2	43.8	41.2	36.7	11.3	0.0	60.0	59.6	74.0	14.0	14.4	

AV DETECT (RBW: 1MHz, VBW:10Hz)

No.	Freq. [MHz]	Reading HOR VER [dBuV]		Ant. Factor [dB/m]	Amp. Gain [dB]	Cable Loss [dB]	Atten. or Filter [dB]	Result HOR VER [dBuV/m]		Limit AV [dBuV/m]	Margin HOR VER [dB]	
Test distance 3meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter)												
1	1239.5	48.1	42.0	23.2	36.9	3.9	0.0	38.3	32.2	54.0	15.7	21.8
2	2483.5	48.2	45.8	30.8	36.2	5.6	0.0	48.4	46.0	54.0	5.6	8.0
3	4960.0	40.9	36.3	35.8	36.1	8.2	0.0	48.8	44.2	54.0	5.2	9.8
4	7440.0	31.6	31.4	38.2	35.7	10.3	0.0	44.4	44.2	54.0	9.6	9.8
5	9920.0	31.1	31.1	37.0	36.3	12.1	0.0	43.9	43.9	54.0	10.1	10.1
Test distance 1meters RESULT=Reading + ANT Factor - Amp Gain + CABLE LOSS + Attenuator (or Filter) - Dfac												
6	12400.0	32.0	31.3	42.3	35.5	4.2	0.0	43.0	42.3	54.0	11.0	11.7
7	14880.0	30.6	30.6	43.0	35.0	5.7	0.0	44.3	44.3	54.0	9.7	9.7
8	17360.0	29.9	29.8	45.4	35.2	7.2	0.0	47.3	47.2	54.0	6.7	6.8
9	19840.0	31.8	31.0	41.2	35.3	8.9	0.0	46.6	45.8	54.0	7.4	8.2
10	22320.0	31.3	31.2	41.4	35.1	10.6	0.0	48.2	48.1	54.0	5.8	5.9
11	24800.0	31.2	31.2	41.2	36.7	11.3	0.0	47.0	47.0	54.0	7.0	7.0

Test Distance 1.0m : Distance Factor(Dfac) = 20log(3/1.0) = 9.5 dB

* Except for the above table : All other spurious emissions were less than 20dB for the limit.

* Atten. : 1 to 3.5GHz, Filter : 3.5 to 26GHz

* In the above table, factor 0.0dB represents no use of Atten. and/or Filter.

* The result is rounded off to the second decimal place. Therefore, there may be 0.1 difference for the result.

In the frequency over the fifth harmonic, the noise from the EUT was not seen. Its base noise implies the system noise floor.

UL Apex Co., Ltd.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

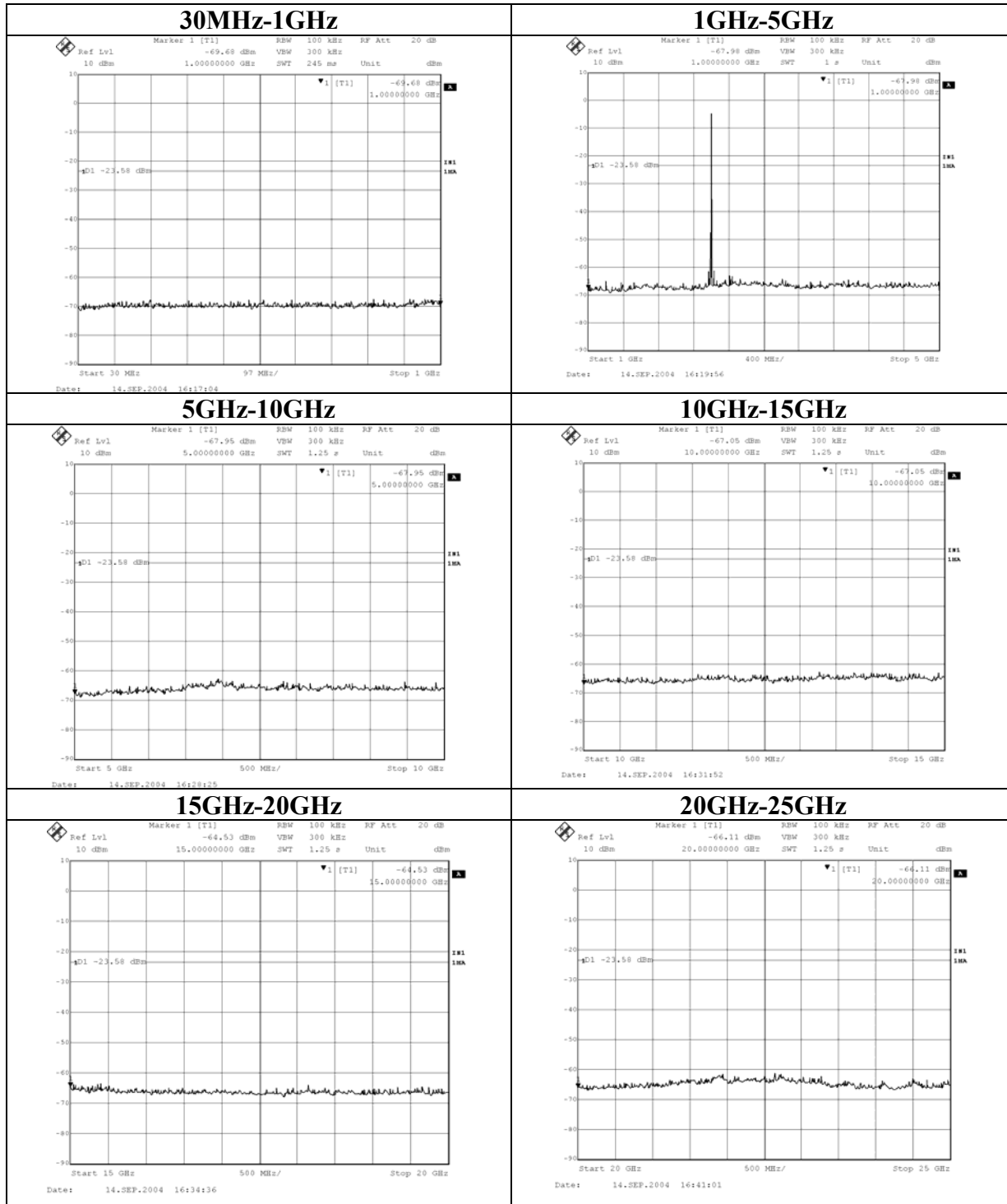
Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

MF060b(10.04.03)

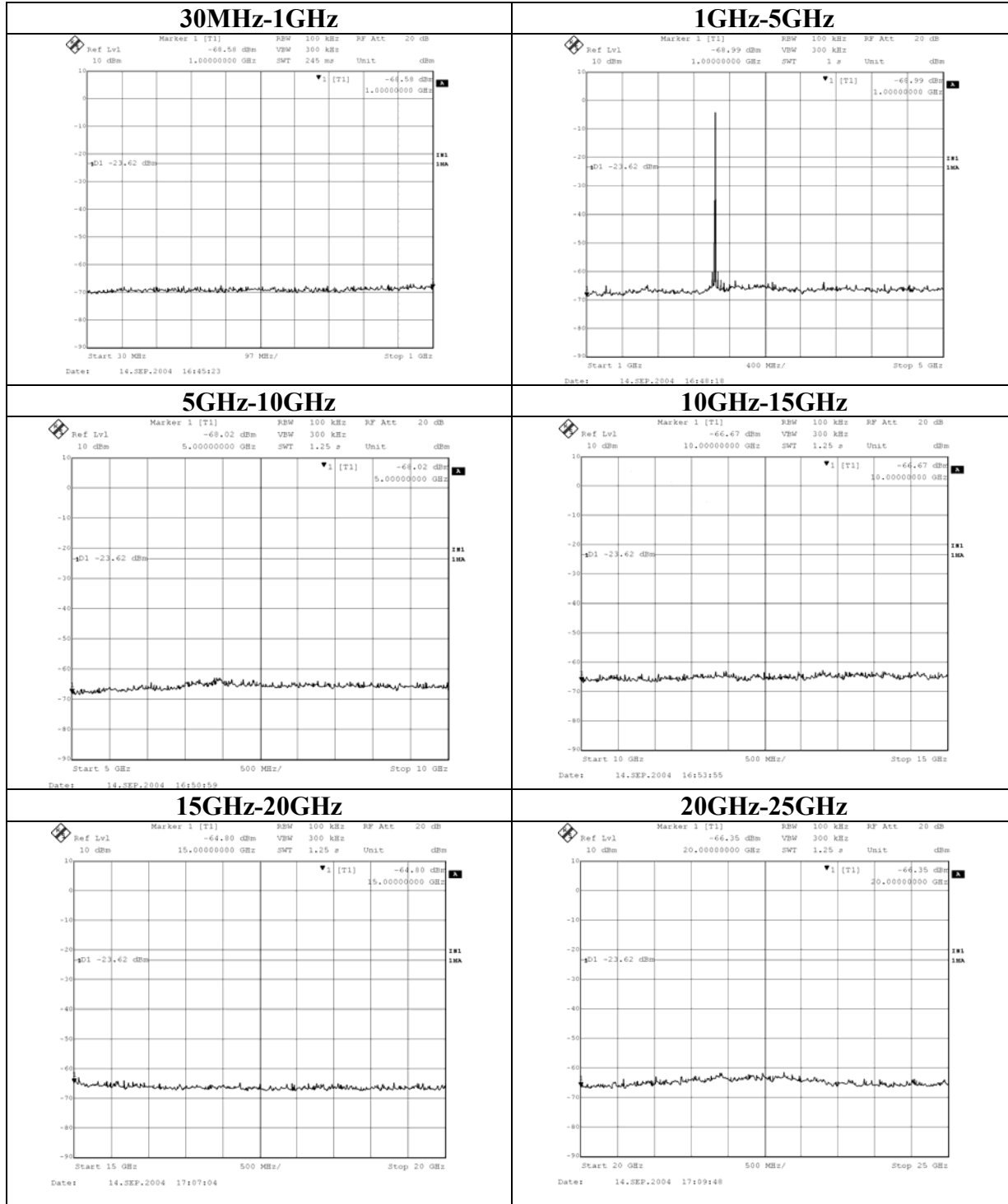
Conducted Spurious Emission (FHSS)

Ch:Low

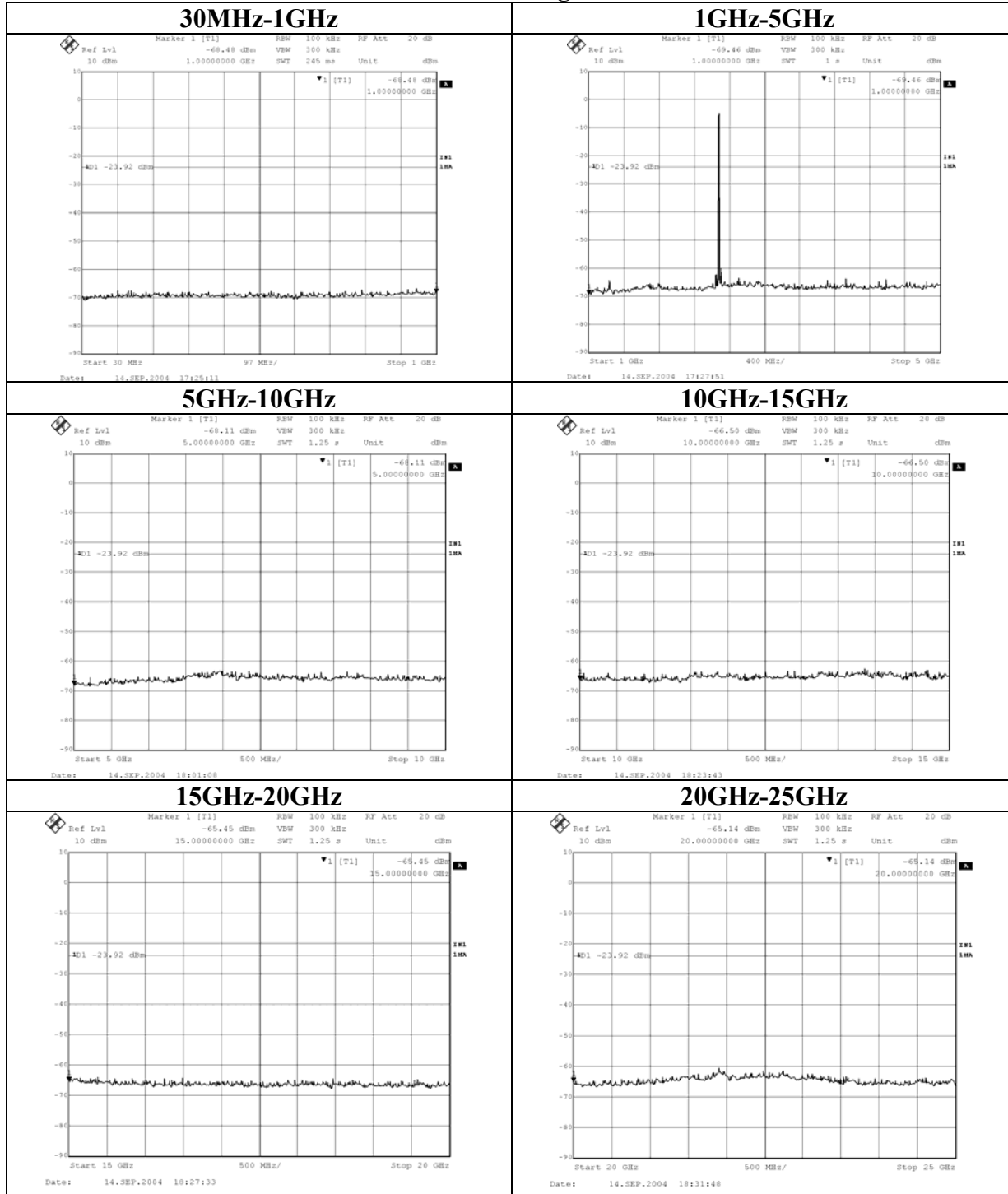


Conducted Spurious Emission (FHSS)

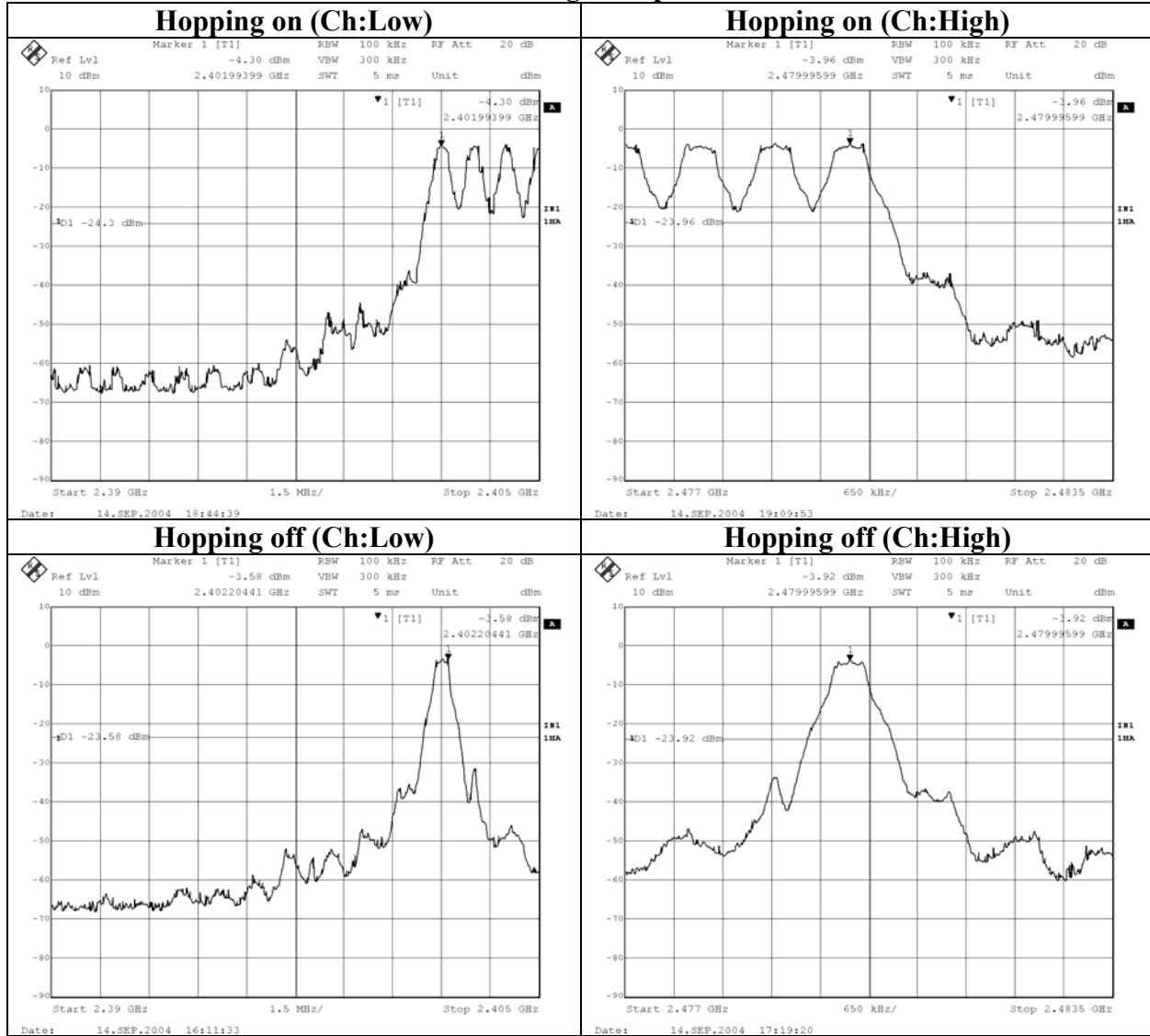
Ch:Mid



Conducted Spurious Emission (FHSS)
Ch:High



Conducted Spurious Emission (FHSS)
Band Edge compliance



99% Occupied Bandwidth(FHSS)

